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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,267	03/23/2001	Hiroyuki Onishi	028567-0105	4564
22428	7590	01/21/2005	EXAMINER	
FOLEY AND LARDNER SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			KIM, CHONG R	
			ART UNIT	PAPER NUMBER
			2623	

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/815,267

**Applicant(s)**

ONISHI ET AL.

**Examiner**

Charles Kim

**Art Unit**

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6-10,12,13,15-19,21,22 and 24-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,6,8,10,13,15,17,19,22,24,26 and 28-30 is/are rejected.
- 7) ☒ Claim(s) 3,7,9,12,16,18,21,25,27,31-33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/31/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment and Arguments***

1. Applicant's amendment filed on October 4, 2004 has been entered and made of record.
2. In view of applicant's amendment, the 112 second paragraph rejections are withdrawn.
3. Applicant's arguments have been fully considered, but they are not deemed to be persuasive for at least the following reasons.

Applicants argue (page 18) that their claimed invention differs from the prior art because "Irani fails to disclose or suggest anything concerning the distinctive selection and addition of a first pixel value to a second pixel value as recited in the presently pending independent claims." The Examiner disagrees. Based on the limitation, "...a first pixel selected from a group of pixels including one pixel and a plurality of pixels around the one pixel in the first similarity degree image..." in claim 1, it is unclear which "distinctive selection" process the Applicants are referring to. It appears that any arbitrary first pixel selected from the first similarity degree image would read on the claimed limitation. In this case, Irani discloses the step of sequentially accumulation adding a first pixel value (C1) of a first pixel selected from the first similarity degree image to a second pixel value (C2) in the second similarity degree image, wherein the first and second pixels have corresponding coordinates (col. 6, lines 13-59 and figure 4).

***Claim Objections***

4. Claim 1 is objected to because of typographical errors. It appears that the phrase “said accumulation addition unit” in line 31, was intended to read “said accumulation-addition unit”. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 4, 6, 8, 10, 13, 15, 17, 19, 22, 24, 26, 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Okabayashi et al., U.S. Patent No. 6,721,462 (“Okabayashi”) and Irani et al., U.S. Patent No. 5,146,228 (“Irani”).

Referring to claim 1, Okabayashi discloses an apparatus for searching corresponding points between an input image and a reference image which is an object of comparison with the input image, said apparatus comprising:

a. a similarity degree image production unit which produces a plurality of similarity degree images each having a plurality of similarity degrees between the input image and the reference image as a pixel value [col. 2, lines 14-43, col. 18, line 21-col. 19, line 4, and figure 7. Okabayashi explains that the reference image is divided into four partial images (each having 8 pixels x 8 pixels), and the correlation operation is performed four times for each of the partial

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reference images, in order to obtain the respective similarity degree images. Note that the distribution of the correlation values is interpreted as the similarity degree image];

b. a corresponding point detection unit which detects corresponding points between the input image and the reference image based on the similarity degree images produced by the similarity degree image production unit (col. 2, lines 38-44);

c. a reference partial image production unit which divides the reference image into a plurality of blocks and thereafter produces a reference partial image (col. 18, line 21-col. 19, line 4);

d. an input partial image production unit which divides the input image into a plurality of blocks and thereafter produces an input partial image (col. 2, lines 14-18);

e. a similarity degree calculation unit which calculates the similarity degrees between the input partial image and the reference partial image, wherein the similarity degree images include a first similarity degree image and a second similarity degree image (col. 2, lines 14-34 and col. 18, line 21-col. 19, line 4).

Okabayashi does not explicitly disclose an accumulation-addition unit which sequentially accumulation-adds a first pixel value selected from the first similarity degree image to a second pixel value in the second similarity degree image. However, this feature was exceedingly well known in the art. For example, Irani discloses an accumulation-addition unit which sequentially accumulation-adds a first pixel value (C1) of a first pixel selected from a group of pixels including one pixel and a plurality of pixels around the one pixel in a first similarity degree image, to a second pixel value (C2) of a second pixel in a second similarity degree image, the one pixel having a coordinate in a block defined by each of the similarity degree images, the

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coordinate corresponding to that of the second pixel, and a corresponding point specific unit which specifies corresponding points based on each of similarity degree images which have been accumulatively added by the accumulation addition unit [col. 6, lines 13-59 and figure 4. Note that the correlation level/amplitude is interpreted as a pixel value of the similarity degree image. Also, note that the coordinate of the one pixel (C1) in the first similarity degree image corresponds to the coordinate of the second pixel (C2) in the second similarity degree image].

Okabayashi and Irani are combinable because they are both concerned with searching corresponding points between an input image and a reference image based on similarity degree images. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the accumulation-addition unit and the corresponding point specific unit of Irani in the image matching system of Okabayashi. The suggestion/motivation for doing so would have been to increase the accuracy and reliability of the image matching process (Irani, col. 5, lines 1-8). Therefore, it would have been obvious to combine Okabayashi with Irani to obtain the invention as specified in claim 1.

Referring to claim 4, Okabayashi further discloses that the similarity degree calculation unit calculates a normalized correlation coefficient between the input partial images and the reference partial image as the similarity degrees (col. 2, lines 14-48 and col. 18, lines 62-66).

Referring to claim 6, Irani further discloses that the accumulation-addition unit recursively repeats accumulation-addition for a plurality of similarity degree images in a horizontal direction, a direction opposite to the horizontal direction, a vertical direction, and a direction opposite to the vertical direction [figure 4. Note that the entire similarity degree images (correlation surfaces) are added together, and therefore the accumulation-addition is performed

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in a horizontal direction, a direction opposite to the horizontal direction, a vertical direction, and a direction opposite to the vertical direction].

Referring to claim 8, Irani further discloses that the corresponding point specific unit specifies a pixel position of a pixel having a maximum pixel value in each of the similarity degree images which have been accumulatively added by the accumulation-addition unit as each corresponding point (col. 6, lines 13-59 and figure 4).

Referring to claim 10, see the rejection of at least claim 1 above.

Referring to claim 13, see the rejection of at least claim 4 above.

Referring to claim 15, see the rejection of at least claim 6 above.

Referring to claim 17, see the rejection of at least claim 8 above.

Referring to claim 19, see the rejection of at least claim 10 above. Okabayashi further discloses a computer program containing instructions for the method described above (figure 8).

Referring to claim 22, see the rejection of at least claim 4 above.

Referring to claim 24, see the rejection of at least claim 6 above.

Referring to claim 26, see the rejection of at least claim 8 above.

Referring to claim 28, Irani further discloses that the accumulation-addition unit sequentially executes the accumulation addition for all the similarity degree images in at least one direction (col. 6, lines 13-59 and figure 4).

Referring to claims 29-30, see the rejection of at least claim 28 above.

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*Allowable Subject Matter*

6. Claims 3, 7, 9, 12, 16, 18, 21, 25, 27, 31-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Conclusion*

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*ck*

ck

January 13, 2005

  
Jon Chang  
Primary Examiner